

REMARKS

Claims 9-13 and 47 are now pending in the application, with Claims 9, 12 and 13 being independent. Claims 9, 10, 12 and 13 have been amended and Claim 47 is newly-presented herein.

In view of the foregoing amendments and following remarks, Applicants respectfully request reconsideration and withdrawal of the rejection set forth in the above-identified Office Action.

Claims 9-13 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,731,828 (Ishinaga et al.). This rejection is respectfully traversed.

As recited in independent Claim 9, the present invention relates to an ink-jet apparatus employing an ink-jet head having a plurality of heaters corresponding to one ejection opening and performing printing by ejecting an ink from the ink-jet head to a printing medium. The ink-jet apparatus includes driving means for applying respective pulses to the plurality of heaters for forming bubbles in the ink for ejecting the ink through the one ejection opening. The driving means is capable of mutually shifting timings of bubble forming at respective heaters of the plurality of heaters on a basis of information relating to an ink temperature of the ink-jet head.

As recited in independent Claim 12, the present invention relates to an ejection amount controlling method in an ink-jet apparatus employing an ink ejecting portion having a plurality of heaters corresponding to one ejection opening and ejecting ink from said ink ejecting portion to a printing medium. The method includes the step of adjusting an ink ejection amount by mutually shifting bubble forming timings at respective heaters of the plurality of heaters upon application of respective pulses to the plurality of heaters, based on information relating to an ink temperature of the ink ejecting portion, for forming bubbles in the ink to eject the ink through the ink ejection opening.

As recited in independent Claim 13, the present invention relates to an ejection amount stabilizing method in an ink-jet apparatus employing an ink ejection portion having a plurality of heaters corresponding to one ejection opening and ejecting ink from the ink ejecting portion to a printing medium. The method includes the step of stabilizing an ink ejection amount by mutually shifting bubble forming timings at respective heaters of the plurality of heaters upon application of respective pulses to the plurality of heaters for forming bubbles in the ink to eject the ink through the ink ejection opening so as to adjust the ink ejection amount.

Ishinaga et al. relates to an ink jet head that includes plural heat generating resistors in liquid flow paths. The heat generating resistors are independently driveable. According to Applicants, the ink ejection amount can be changed by varying combinations of the plural heaters to be driven. However, Applicants further submit that Ishinaga et al. does not disclose or suggest that the ink ejection amount can be changed by varying bubble forming timing at the respective heaters.

Accordingly, Ishinaga et al. fails to disclose or suggest driving means being capable of mutually shifting timings of bubble forming at respective heaters of the plurality of heaters on a basis of information relating to an ink temperature of an ink jet head, as is recited in independent Claim 9.

Ishinaga et al. also fails to disclose or suggest adjusting an ink ejection amount by mutually shifting bubble forming timings at respective heaters of a plurality of heaters upon application of respective pulses to the plurality of heaters, based on information relating to an ink temperature of an ink ejecting portion, as is recited in independent Claim 12.

Nor does Ishinaga et al. disclose or suggest stabilizing an ink ejection amount by mutually shifting bubble forming timings at respective heaters of a plurality of heaters upon application of respective pulses to the plurality of heaters for forming bubbles in the ink to eject the ink so as to adjust the ink ejection amount, as is recited in independent Claim 13.

Thus, Ishinaga et al. fails to disclose or suggest important features of the present invention recited in independent Claims 9, 12 and 13. Accordingly, reconsideration and withdrawal of the § 102 rejection are respectfully requested.

For the foregoing reasons, Applicants respectfully submit that the present invention is patentably defined by independent Claims 9, 12 and 13. Dependent Claims 10, 11 and 47 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of these dependent claims is requested.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejection set forth in the above-noted Office Action, and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in
our Washington, D.C. office by telephone at (202) 530-1010.
All correspondence should be directed to our address given
below.

Respectfully submitted,


Attorney for Applicants

Registration No. 33,628

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York, 10112-3801
Facsimile: (212) 218-2200

MAW\agm